(v) Summary of Claimed Subject Matter (amended)

In the embodiment represented by claim 1, a method of forming a refractory metal-intermetallic composite (RMIC) is described. As described in paragraph 3 of the specification, these materials, exemplified by the niobium-silicide alloys, provide an unusual combination of properties. The materials can withstand very high temperatures – much higher than traditional nickel-based superalloys. Moreover, the ductile metal phase (Nb-based) and the relatively brittle intermetallic phase (often Si-based) provide a very useful combination of mechanical properties over a wide range of temperatures. (See paragraph 3 of the specification). These properties include low-temperature toughness and high-temperature strength and creep-resistance. For these reasons, the RMIC's are especially suited for use in demanding applications like gas turbine engines.

While RMIC's have tremendous potential, their manufacture can be extremely difficult. As described in paragraph 4 of the specification, the typical thermo-mechanical forming, casting, and solidification techniques cannot always be used with RMIC materials which have such high melting temperatures. For example, extrusion temperatures of about 1450ºC-1650ºC are required, with minimal dimensional change. Moreover, the complex chemistry and high reactivity of these alloys make microstructural control difficult to achieve, resulting in a greater incidence of defective castings.

In the embodiment which is the basis for claim 1, the serious processing problems are addressed by a partitioning step, in which a first powder of a refractory metal suitable for forming a metal phase is blended with a second powder containing a silicide precursor suitable for forming an intermetallic phase (page 4, paragraph 12 of the specification). The first powder comprises at least one of niobium, titanium, and molybdenum, and the second powder comprises at least one of silicon, germanium, and boron (page 4, paragraph 13).

After the blending/partitioning step, the powder blend is consolidated and mechanically deformed at a prescribed temperature. (See page 6, paragraph 16 of the specification). As recited in claims 12 and 13, and more fully described in paragraph 16, the lower-temperature consolidation and deformation step is carried out at a temperature which minimizes the formation of the silicide component, so as to avoid cracking. Other

important advantages of carrying out this step at relatively low temperatures are described in paragraph 17 of the specification.

The third step set forth in claim 1 requires a higher-temperature reaction to thermally treat the consolidated and deformed powder. As set forth in claims 15 and 16, the thermal-treatment step is preferably carried out at a temperature greater than that required for the silicide reaction, e.g., greater than about 1,050°C. As set forth in page 7, paragraphs 18 and 19, this step results in the formation of the desired metal/intermetallic phase structure, i.e., one which provides a prescribed balance of mechanical and environmental properties.

Claim 23 is directed to a method for forming an article from an RMIC (refractory metal-intermetallic composite) material. The method comprises the steps of blending first and second powders, as described in paragraph 7, page 3 of the specification, lines 1-4. The first powder includes a refractory metal suitable for the metal phase, while the second powder comprises a silicide precursor suitable for the intermetallic phase, as also noted in lines 1-4 of paragraph 7. The blending step is followed by the consolidation/deformation step at a first temperature, as described in lines 5-9 of paragraph 7 (page 3). The powder is then blended at a second, higher temperature to form the metal and intermetallic phases, as also described in lines 5-9 of paragraph 7 (page 3). First powder materials like niobium, titanium, and molybdenum are described in lines 1-4 of paragraph 13 (page 4) of the specification. Second powder materials like silicon, germanium, and boron are described in lines 5-6 of paragraph 13 (page 4).

Respectfully submitted,

/Francis T. Coppa/
Francis T. Coppa
Reg. No. 31,154
General Electric Company
Building K1, 3A67
One Research Circle
Niskayuna, New York 12309
Telephone: (518) 387-7530
August 5, 2009